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Effectiveness of the Strengthening Families Programme 10–14 in Poland: cluster randomized controlled trial

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Abstract

Background: The Strengthening Families Programme for youth aged 10-14 and parents/carers (SFP10-14) is a family-based prevention intervention with positive results in trials in the United States. We assessed the effectiveness of SFP10-14 for preventing substance misuse in Poland.

Methods: Cluster randomized controlled trial with 20 communities (511 families; 614 young people) were allocated to SFP10-14 or a control arms. Primary outcomes were alcohol, smoking and other drug use. Secondary outcomes included parenting practices, parent–child relations, and child problem behaviour. Interview-based questionnaires were administered at baseline and at 12- and 24-months post-baseline, with respective 70.4% and 54.4% follow-up rates.

Results: In Bayesian regression models with complete case data we found no effects of SFP10-14 for any of the primary or secondary outcomes at either follow-up. For example at 24-months, posterior odds ratios and 95% credible intervals for past year alcohol use, past month binge drinking, past year smoking, and past year other drug use, were 0.83 (0.44-1.56), 0.83 (0.27-2.65), 1.94 (0.76-5.38), and 0.74 (0.15-3.58), respectively. Although moderate to high attrition rates, together with some evidence of systematic attrition bias according to parent education and family disposable income, could have biased the results, the results were supported in further analyses with propensity score matched data and 40 multiple imputed datasets.

Conclusion: We found no evidence for the effectiveness of SFP10-14 on the prevention of alcohol or tobacco use, parenting behaviour, parent-child relations or

child problem behaviour at 12- or 24-month follow-up in a large cluster randomised controlled trial in Poland.

(Key words: alcohol, tobacco, drugs, youth, strengthening, families)

Introduction

Alcohol and other drug use increases markedly between the ages of 11 and 15 years amongst young people in Poland. Between the ages of 11 and 15 the proportion of those who smoke at least once a week increases from 2% to 15%. At age 11, 3% report drinking alcohol at least once a week, and this increases to 11% amongst 15-year-olds. Moreover, 24% of Polish youth report lifetime cannabis use, while in 2006 it was 18% [1, 2]. Early alcohol and other drug use is associated with a range of subsequent adverse health and social outcomes [3-7].

The Strengthening Families Program 10–14 (SFP10-14) is a US-developed family-based intervention for preventing alcohol and other drug use and problems amongst young people. It has been evaluated in two large-scale randomized controlled trials in Iowa, USA and has informed the development of a family-based intervention for African American families evaluated in a large randomized controlled trial in rural Georgia, USA. Several systematic reviews have highlighted the promising results from these trials but also note the question of whether this US-developed intervention will be applicable in other countries and settings [8-10].

Our aim was to undertake a cluster randomised controlled trial to assess the effectiveness of the Polish version of the SFP10-14 ("Program Wzmacniania Rodziny" [11]) when compared with a control group. The specific objectives were to examine the effectiveness of the SFP10-14 for:

- Preventing alcohol and drug misuse amongst 10–14 years-olds in Poland. Substance misuse measures were the primary outcomes in the trial.

- Promoting positive parenting practices in parents of 10–14 year-olds in Poland
- Promoting positive parent–child relations amongst families with 10–14 year-olds in Poland
- Reducing problem behaviour amongst 10–14 year-olds in Poland

Methods

Design Overview

A parallel group cluster randomized controlled trial with communities randomly assigned, using concealed allocation, to the intervention or control group with a 2:1 allocation ratio. Four communities could not be randomised: two because they were already providing the intervention, and two because they were not able to provide the intervention. These four communities were allocated to intervention and control groups, respectively. Communities in the intervention arm participated in SFP10-14 group sessions; communities in the control arm of the trial received information leaflets for families.

No formal sample size calculation was undertaken but funding was requested for a sample size (N = 600 families) which was similar to that used as a basis for other trials of the SFP10-14 [12-16]. These other trials have reported SFP10-14 effectiveness for reducing a number of risky behaviours amongst young people, including alcohol and drug use and misuse and other behavioural problems. The International Standard Randomised Controlled Trial Number for this study is: ISRCTN89673828 and the protocol for the trial has been published [17].

Setting and Participants

Eligible participants were families with 10–14 year-old children from community settings across Poland. Information about the SFP10-14 was disseminated throughout Poland via conferences, journal articles, information bulletins and personal contact. Twenty communities who expressed an interest in the SFP10-14 were approached in 2010 and agreed to participate in the trial. Within communities, volunteer community workers acted as trial guardians and were tasked with recruiting 36 families per community to participate in the trial. There was no racial or gender bias in the selection of participants. Following feasibility work, we anticipated a higher drop-out rate in families in the intervention communities once they found out that they were expected to attend the parenting programme, so we allocated communities with a 2:1 ratio to intervention or control arms. Family recruitment took place through community agencies, schools and via information leaflets and personal contact. In all families at least one parent had to agree to participate. If two or more children from the same family were involved in the intervention group then both parents were asked to participate in SFP10-14 group sessions.

Ethics Committee approval for data collection was obtained from "Komisja Bioetyczna przy Instytucie Psychiatrii i Neurologii W Warszawie" (Ethics Committee of the Warsaw Institute for Psychiatry and Neurology). Each family recruited into the trial received an information sheet describing the trial and data collection procedures before giving their written and signed consent to participate. Consent was obtained from parent(s) and, separately, from children.

Randomization and Interventions

Randomisation occurred after communities had consented to participate in the trial. The lead investigator, drawing names out of a hat in a concealed allocation format, with a 2:1 allocation ratio, undertook simple randomisation of community to intervention or control arm. In each community, field workers acted as trial guardians to recruit families to the trial. Recruitment of families was ongoing over the first year of the trial, and trial guardians were not blinded to the trial group that their community was in, but they were trained to not reveal the group until a family had agreed to participate in the trial. Due to the nature of the intervention blinding of participants, SFP10-14 facilitators and data collectors was not possible.

Communities were recruited via an information campaign, and twenty communities agreed to participate in the trial. Of these, four were not randomised, and the remaining sixteen communities agreed to be randomised and were randomly allocated to SFP10-14 (n=11) or control arms (n=5) using the concealed allocation hat-based randomisation. Because of sample size and statistical power considerations, in primary analyses we retained the communities that were not randomised and in subsequent sensitivity analyses we propensity score matched SFP10-14 and control community participants.

The SFP10–14 is a video based programme delivered by trained facilitators that includes parents/guardians and children learning together [18-21]. The 7-week program is delivered over 7-sessions. The weekly sessions last two hours: in the first hour parallel groups of children and parents from up to 15 families develop their understanding and skills, led by parent and child group facilitators; in the second

hour, parents and children come together in family units to practice the principles they have learned [18-21].

Outcomes and Follow-up

Protocol-declared primary outcomes were self-reported: alcohol, cigarette and other drug use; alcohol use without parent permission; and drunkenness and binge drinking in the past 30 days. We did not arbitrarily prioritise some primary outcomes over others for hypothesis testing purposes. Instead we were interested in patterns and consistency of outcomes across a range of measures. Secondary outcomes included in this paper were child self-reported scales of General Child Management [22-24], Parent-Child Affective Quality [22, 24], Aggressive and Hostile Behaviors in Interactions [22, 24], Aggressive and Destructive Conduct [25, 26], and the Strengths and Difficulties Questionnaire Externalising Behaviours subscale [27]. All families recruited into the trial were assessed at baseline and followed-up at 12- and 24-months. Following final data collection, families from control communities were offered the opportunity to participate in SFP10-14.

Statistical Analysis

Data from the community-administered questionnaires were entered into a computer database and the final dataset was checked for inconsistencies and cleaned. At the end of the trial all personal identifying details were removed from the dataset. All analyses were intention-to-treat (ITT) and all participants were followed up regardless of their compliance with the intervention. Data analysis was performed in 2015-16.

Bayesian regression estimates and 95% credible intervals were estimated using the RStanArm and RStan packages in the R statistical programming language [28, 29]. Bayesian analysis has a number of advantages over classical frequentist analysis: the ability to combine prior information with data; the calculation of exact parameter estimates without reliance on large sample size; direct estimation of any functions of parameters or any quantities of interest; it obeys the likelihood principle; it provides interpretable answers (credible intervals have more intuitive meanings); and it can be applied to a wide range of models, e.g. hierarchical models.

We used a weakly informative [30] student *t* prior for the coefficients, with 7 degrees of freedom, location zero and scale 2.5. Weakly informative prior distributions affect inferences only when the data provide little information about the parameters. All primary outcome substance use measures were binary coded, with 0 (zero) representing no use and 1 (one) indicating use. Therefore a binomial model with logit link function was specified in RStanArm. Location was entered as a random effect, and fixed effects were experimental group, gender, age, baseline parental drinking, baseline child management practices, and baseline substance use for the corresponding outcome. Cases with missing values were omitted from the data analysis in a complete case (CC) analysis. In a Markov Chain Monte Carlo (MCMC) procedure, for each model three chains were specified, with 3000 iterations (1000 warm-up) with thinning = 2. Model and diagnostic plots were inspected for any problems, and confirmed the appropriateness of the MCMC specifications used. Parameter estimates and credible intervals from the models were exponentiated to provide posterior odds ratios.

Baseline non-equivalence was identified as a potential problem, so to address this we used propensity score matching with the MatchIt package in the R statistical programming language [31]. We were able to produce a good propensity score matched dataset (nearest method with logit distance, caliper = 0.2) using age, parent binge drinking, parent child management score, parent education, and family disposable income as predictors of group allocation. The CC analysis was then repeated using the propensity score matched (PSM) data. Finally, because attrition was high and there were also cases with missing values excluded from the CC analysis, we undertook a multiple imputation (MI) analysis of both the CC and the CC PSM datasets, with 40 imputed datasets for each, using the Amelia package in the R statistical programming language [32]. The Bayesian regression analyses were repeated with both the MI and the MI PSM data, with similar results. Only the MI PSM results are reported here.

Secondary outcomes represented continuous measures of family relationships, parenting and child behaviours and we used a Gaussian function in the Bayesian linear regression analysis. Location was entered as a random effect, and fixed effects were experimental group, gender, age, and baseline values for the corresponding outcome. With these specifications, we used the same modelling approach as with primary outcomes.

Results

The sample at baseline (N = 511 families; N=614 children) consisted of parents, carers and young people from twenty communities across Poland. Families and young people were recruited into the study in 2010, and followed up for 12- and 24-months. Recruitment, follow-up and attrition are described in Figure 1. No communities were lost to follow-up. Family / young people follow-up rates were 70.4% of young people responding at 12-months, and 54.4% responding at 24-months. We were not able to collect information from participants about reasons for non-completion of follow-up questionnaires.

[Figure 1 about here]

Sample characteristics are described in Table 1. Average age was similar in experimental and control groups, but there were fewer females in the experimental (36.6%) than the control (44.5%) conditions. There were some notable discrepancies in parent education, with relatively more parents only educated at primary level in the control condition (18.8%) when compared with the experimental condition (10.4%). More experimental group parents were educated to college level (27.6% vs. 20.1%).

[Table 1 about here]

Figure 1 shows participants (young people) lost to follow-up: 131/367 (35.7%) and 190/367 (51.8%) were lost to follow-up in the intervention group at 12- and 24-

months, respectively. This compares with lower attrition rates of 51/247 (20.7%) and 90/247 (36.4%) in the control group. Loss to follow-up was also higher amongst full-time employed and better educated families (Table 1).

Table 2 shows baseline (and follow-up) proportions for the primary outcome measures. For all measures, baseline and follow-up rates were a bit higher in the experimental than the control group. For example, baseline past year alcohol use was 17.9% in the experimental group compared with 11.0% in the control group. Figures for past month alcohol use without permission were 4.3% and 2.1%, respectively.

[Table 2 about here]

For each of the Bayesian models we assessed model performance by inspecting traceplots (for assessing convergence and diagnosing chain problems), density plots (for comparing the target distribution by chains and whether each chain has converged in a similar space) or autocorrelation plots (for checking misbehaviour or poor convergence over several chains or parameters). None of the models were regarded as problematic according to the diagnostic plots (illustrative diagnostic plot is available as a supplementary file). In this study, no ancillary analyses were undertaken, and no adverse events were reported.

The intra class correlation coefficients (ICCs) for the primary outcome measures, at baseline, are reported in Table 2. They are all low, ranging from 0.001 (past year drunkenness) to 0.053 (past year cigarette use).

At both 12- and 24-month follow-up the analysis showed no effects of the intervention on primary or secondary outcome measures (Table 3) in a completed case (CC) analysis. Although there were no statistically significant effects, it is notable that for all primary outcome variables, substance misuse rates were consistently higher in the intervention group, reflecting baseline rate differences and potentially also differential attrition (Table 2). To address this concern, Bayesian regression models were repeated with propensity score matched data and multiple imputation (40 imputed datasets). These further analyses confirmed initial findings of no effects of the intervention on primary or secondary outcome measures (Table 3).

[Table 3 about here]

Discussion

We have found that the SFP10-14 intervention, adapted for use in Poland, did not have any impact at 12- or 24-month follow-up on substance misuse outcomes or on parenting skills, parent-child relations or child problem behaviour. These findings are not consistent with SFP10-14 trial results from the United States, but are consistent with emerging results from two other SFP10-14 trials in Europe [33, 34].

The 24-month follow-up in this Polish trial may be too short to clearly identify impacts on substance misuse outcomes. In US studies, significant effects on substance misuse outcomes emerged only at 48-months [13, 14]. However, it was surprising that in our analyses there was no effect of the intervention on secondary, mediating, outcomes. According to SFP10-14 theory, the intervention should have an

impact on these proximal variables and we expected to see an effect of the intervention on these measures. Previous SFP studies have reported significant improvements in the short term on parent-child affective quality, child management indicators and parenting behaviours specifically targeted by the SFP intervention [24]. At 12 month follow up in one study, significant impacts were found on parenting behaviours such as specific rules and anger management, which are associated with improved parent and child affective quality and child management [35]. Other short term positive impacts on family cohesion, parental involvement, concentration, depression and hyperactivity have also been reported for various versions of the SFP program in studies in the United States [36].

The SFP10-14 is designed for young people (and their parents / carers) aged 10 to 14 years old, although in the US trials the young people were at the lower end of this range at baseline and during the intervention. In the Polish trial, around a third of young people were aged 13-14, and this may be a factor in the lack of effectiveness of the intervention in Poland. However, it could also be argued that positive substance misuse outcomes are more likely to be identified over the short-term in the Polish trial given the slightly older age group than in US studies.

Overall, these results suggest that the SFP10-14, as adapted and implemented in Poland, is not effective in improving parenting skills, family-child relationships, and substance misuse outcomes. During the process of adaptation and implementation of the SFP10-14 for Poland, some Polish experts were critical of some elements of the program content, for example giving extra chores as a sanction for poor behaviour. These elements were left unchanged in the Polish version to maintain a close fit with

the original program logic model, but it is possible that they are less relevant or appropriate for Polish families, and therefore diminished the program effects. Overall though, we are confident that the adaptations to the program were only surface rather than deep changes [37], for example changes to the wording of particular presentations or the substitution of more culturally relevant activities for particular aspects. None of the substantive theory based mediators of change from the program logic model were revised or removed, unlike a recent Swedish adaptation[38]. Moreover, in this study the programme was implemented with good coverage and fidelity to the Polish SFP10-14 manual. Therefore, this study provided a robust test of the original SFP10-14, albeit in a different cultural setting, and it is possible that contextual differences in alcohol culture between the US and Poland (and other European countries) might account for at least some of the variation in effectiveness found between these two continents. However, what the important contextual aspects are is not very clear and is an area for future research.

In this cluster trial the randomization was compromised because four communities were not randomised, increasing the risk of selection bias. Moreover, families and young people were recruited through trial guardians, and it is possible that, despite training, these guardians were not able to maintain allocation concealment at the individual family level, leading to a potential systematic bias in the type of family recruited into the study. There was some evidence for this in the baseline characteristics, with parent education, disposable income and baseline substance use

all appearing to be somewhat different in the experimental than control community participants. It is a possibility therefore that we haven't adequately controlled for potentially influential factors, although we undertook robust propensity score matched data analysis and multiple imputation for missing data, with no notable changes to the results.

The attrition rate in this trial was moderate to high, at 29% overall for 12-month follow-up, and 56% overall for 24-month follow-up, consistent with some other preventive randomised controlled community trials [39]. This missing data could have biased the results, although the multiple imputation analysis suggested otherwise. It is possible though that the models used to impute missing data may have excluded important (possibly unmeasured) variables. Despite these potential threats to internal validity, we are reasonably confident that the results from this trial are generalizable to the population of similar communities and families in Poland from which the trial sample was drawn.

In conclusion, our results show no evidence for the effectiveness of SFP10-14 for the prevention of substance misuse over 24-months in a Polish community-based population. The applicability of SFP10-14 to populations and settings that are different from those in available trials is uncertain. Moreover, an overall general conclusion of no effect for this intervention cannot be discounted.

Keypoints

* The Strengthening Families Programme 10-14 (SFP10-14) was evaluated in a cluster randomized controlled trial in Poland with N=614 young people

* Over two years there were no impacts on parenting, family relations, child problem behaviour or child substance use, using bayesian regression analyses with checks on group comparability

* The applicability and effectiveness of SFP10-14 in other settings is not supported in the results of this trial

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Authors' contributions

All authors have contributed to the development and writing of this paper. KO-K led on study design, methodological development, and analytical strategy and consulted DF on these aspects. KO-K was responsible for fieldwork and data collection. HC and DF undertook statistical analyses. ED drafted parts of the manuscript concerned with previous SFP10-14 studies and results. DF wrote the first draft and all authors helped with revisions to the final, submitted version. All authors have approved this manuscript.

Competing interests

Okulicz-Kozaryn declares that she has received payment for training SFP10-14 facilitators. Foxcroft declares that at the time of this study Oxford Brookes University operated a training consultancy service for the SFP10-14 that received funding from the alcohol industry.

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Table 1. Baseline Demographic Characteristics by Group: Full Sample and Unavailable for Follow-up (mean ± s.d., or %, and (denominator N))

	Full Sample		Not available at Follow-up (12 months)		Not available at Follow-up (24 months)	
	SFP10-14	**Control**	**SFP10-14**	**Control**	**SFP10-14**	**Control**
Child Characteristics						
Age (*mean ± s.d.*)	12.1 ± 1.5 (283)	11.6 ± 1.4 (206)	12.1 ± 1.6 (95)	12.1 ± 1.5 (32)	12.2 ± 1.5 (140)	11.5 ± 1.8 (61)
Gender (*% Female*)	36.6 (358)	44.5 (245)	38.5 (122)	34.0 (50)	38.7 (181)	40.5 (89)
Family Characteristics						
Family Structure (*% Dual Parent)*	72.9 (336)	76.2 (239)	69.0 (116)	58.0 (49)	75.3 (170)	65.5 (87)
Parent Employment Status [1] (*% Employed Full-Time*)	54.8 (367)	60.7 (247)	48.1 (131)	45.1 (51)	52.1 (190)	47.8 (90)
Parent Education [2]						
Primary	10.4 (324)	18.8 (224)	10.8 (111)	15.6 (45)	13.4 (164)	21.5 (79)
Secondary	26.7 (324)	29.9 (224)	27.0 (111)	46.7 (45)	28.7 (164)	39.2 (79)
College	27.6 (324)	20.1 (224)	30.6 (111)	24.4 (45)	28.7 (164)	19.0 (79)
University	35.3 (324)	31.3 (224)	31.5 (111)	13.3 (45)	29.3 (164)	20.2 (79)
Disposable Income, per person [3]						
Low	70.5 (315)	73.7 (224)	69.4 (108)	72.3 (47)	69.9 (163)	82.9 (82)
Medium	22.9 (315)	20.1 (224)	22.2 (108)	21.3 (47)	23.3 (163)	13.4 (82)
High	6.7 (315)	6.3 (224)	8.3 (108)	6.4 (47)	6.8 (163)	3.7 (82)

[1] Either parent. [2] Highest parent education level. [3] Highest category used if inconsistent information. Low: 0-600 Polish Zloty (PLN); Medium: 601-1200 PLN; High: 1201+ PLN

Table 2. Primary Outcome Measures Baseline Intra-Class Correlations (ICC), and Baseline and Follow-Up proportions for full sample

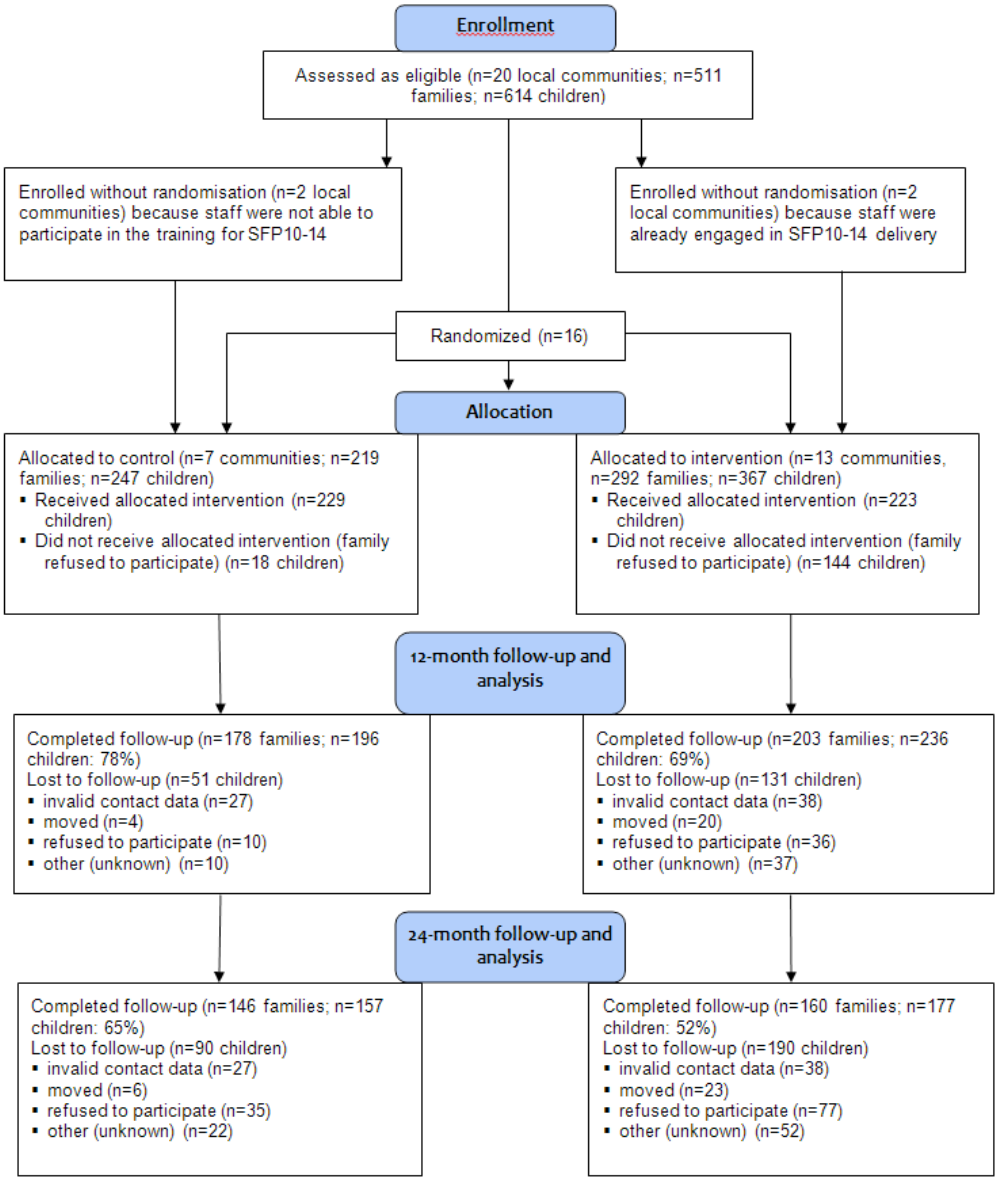
	ICC (Baseline)	Baseline SFP10-14	Baseline Control	12 month Follow-Up SFP10-14	12 month Follow-Up Control	24 month Follow-Up SFP10-14	24 month Follow-Up Control
Primary Outcomes		**% (N)**	**% (N)**	**% (N)**	**% (N)**	**% (N)**	**% (N)**
Lifetime Alcohol Use	0.036	25.4 (338)	19.9 (241)	28.8 (233)	18.6 (194)	35.1 (174)	29.2 (154)
Lifetime Alcohol Use without Permission	0.030	13.6 (330)	10.0 (240)	18.5 (227)	10.4 (193)	30.6 (170)	19.0 (153)
Past Year Alcohol Use	0.024	17.9 (313)	11.0 (228)	21.1 (227)	12.4 (193)	25.6 (172)	25.2 (151)
Past Year Alcohol Use without Permission	0.025	9.2 (328)	5.5 (236)	12.8 (226)	8.3 (192)	20.1 (169)	17.8 (152)
Past Month Alcohol Use	0.040	6.7 (329)	3.3 (241)	7.1 (225)	6.3 (192)	11.8 (169)	10.7 (150)
Past Month Alcohol Use without Permission	0.024	4.3 (327)	2.1 (235)	5.3 (226)	4.2 (192)	10.1 (168)	8.6 (152)
Lifetime Drunkenness	0.014	8.8 (329)	5.0 (241)	10.0 (229)	6.3 (192)	14.0 (172)	7.9 (152)
Past Year Drunkenness	0.001	4.9 (329)	3.4 (236)	4.8 (228)	3.7 (191)	10.5 (171)	6.6 (152)
Past Month Drunkenness	0.008	1.3 (329)	0.3 (236)	1.3 (227)	1.6 (192)	3.5 (172)	3.3 (152)
Past Month Binge Drinking	0.024	4.0 (328)	3.4 (239)	5.8 (225)	4.7 (193)	7.1(170)	6.6 (151)
Lifetime Cigarette Use	0.041	17.7 (339)	10.4 (240)	22.3 (233)	11.9 (194)	31.6 (174)	16.9 (154)
Past Year Cigarette Use	0.053	11.4 (325)	4.2 (236)	14.3 (224)	7.9 (191)	21.5 (172)	9.2 (153)
Past Month Cigarette Use	0.019	6.4 (329)	2.5 (240)	9.2 (229)	5.7 (192)	12.7 (173)	5.8 (154)
Past Year Drug Use	0.006	5.3 (324)	3.0 (235)	6.3 (222)	3.1 (193)	3.6 (169)	4.7 (149)

Table 3: Bayesian Regression Estimates of SFP10-14 Effectiveness Compared with Controls at 12- and 24-Months Follow-up: Complete Case (CC) Models; CC Models with Propensity Score Matched (PSM CC) Data; and Multiple Imputed PSM Data Models (PSM MI)

	12-Month Follow-up			24-Month Follow-up		
	CC Model (95% Credible Interval)	**PSM CC Model** (95% Credible Interval)	**PSM MI Model** (95% Credible Interval)	**CC Model** (95% Credible Interval)	**PSM CC Model** (95% Credible Interval)	**PSM MI Model** (95% Credible Interval)
Substance Use Primary Outcomes [1]						
Lifetime Alcohol Use	1.28 (0.69-2.39)	1.21 (0.60-2.55)	1.36 (0.77-2.44)	0.90 (0.48-1.67)	0.92 (0.44-2.00)	0.93 (0.56-1.55)
Lifetime Alcohol Use without Permission	1.58 (0.68-3.73)	1.65 (0.65-4.23)	1.22 (0.62-2.41)	1.38 (0.71-2.77)	1.05 (0.49-2.28)	1.17 (0.69-1.99)
Past Year Alcohol Use	1.65 (0.67-4.24)	1.78 (0.74-4.50)	1.24 (0.64-2.44)	0.84 (0.44-1.56)	0.71 (0.34-1.57)	0.90 (0.54-1.47)
Past Year Alcohol Use without Permission	1.15 (0.49-2.77)	1.22 (0.38-4.12)	1.15 (0.57-2.31)	0.84 (0.40-1.69)	0.80 (0.33-1.93)	0.91 (0.52-1.58)
Past Month Alcohol Use	0.84 (0.21-3.29)	0.92 (0.22-3.70)	0.98 (0.41-2.24)	0.88 (0.38-2.06)	0.68 (0.25-2.00)	0.98 (0.50-1.93)
Past Month Alcohol Use without Permission	1.18 (0.26-5.27)	0.97 (0.11- 7.50)	0.98 (0.36-2.62)	0.86 (0.31-2.28)	0.88 (0.25-2.91)	0.91 (0.43-1.87)
Lifetime Drunkenness	1.44 (0.53-4.08)	1.83 (0.46-7.11)	1.12 (0.50-2.50)	1.59 (0.52-4.77)	1.32 (0.24-7.04)	1.13 (0.54-2.31)
Past Year Drunkenness	1.26 (0.33-5.34)	2.71 (0.28-27.49)	1.02 (0.39-2.63)	1.34 (0.46-4.20)	1.04 (0.30-3.75)	1.02 (0.46-2.23)
Past Month Drunkenness	2.46 (0.24-35.33)	15.10 (0.62-1829.10)	1.03 (0.26-4.04)	0.71 (0.10- 4.66)	1.13 (0.13- 9.71)	0.89 (0.29-2.59)
Past Month Binge Drinking	0.85 (0.23-3.17)	1.13 (0.22-5.58)	0.88 (0.33-2.26)	0.83 (0.27-2.65)	0.67 (0.16-2.58)	0.89 (0.40-1.92)
Lifetime Cigarette Use	1.41 (0.68-3.05)	1.68 (0.73-3.84)	1.43 (0.71-2.92)	1.42 (0.70-2.81)	1.50 (0.59-3.69)	1.27 (0.68-2.38)
Past Year Cigarette Use	1.29 (0.55-3.22)	1.56 (0.54-4.69)	1.21 (0.58-2.51)	1.94 (0.76-5.38)	2.20 (0.70-7.50)	1.50 (0.77-2.95)
Past Month Cigarette Use	1.13 (0.38-3.54)	1.37 (0.39- 4.95)	1.13 (0.47-2.77)	2.13 (0.72- 6.44)	3.13 (0.89-12.75)	1.31 (0.56-2.99)
Past Year Drug Use	3.09 (0.75-17.03)	3.35 (0.60-21.99)	1.25 (0.46-3.38)	0.74 (0.15-3.58)	0.78 (0.15-3.70)	0.96 (0.40-2.24)
Family and Behaviour Secondary Outcomes [2]						
General Child Management	0.01 (-0.03-0.06)	0.01 (-0.05-0.06)	0.02 (-0.12-0.17)	0.00 (-0.05-0.05)	0.02 (-0.03-0.08)	0.00 (-0.12-0.11)
Parent-Child Affective Quality	0.02 (-0.06-0.10)	0.01 (-0.10-0.11)	0.01 (-0.07-0.09)	0.06 (-0.04-0.18)	0.06 (-0.04-0.18)	0.03 (-0.05-0.10)
Aggressive and Hostile Behaviour in Interactions	0.06 (-0.03-0.15)	0.03 (-0.07-0.13)	0.02 (-0.06-0.11)	0.06 (-0.04-0.17)	0.03 (-0.10-0.17)	0.01 (-0.07-0.10)
Index of Aggressive and Destructive Conduct	0.01 (-0.09-0.11)	0.02 (-0.10-0.14)	0.00 (-0.09-0.09)	-0.04 (-0.18-0.11)	-0.06 (-0.23-0.11)	0.00 (-0.12-0.11)
SDQ Externalising Behaviours subscale	-0.01 (-0.03-0.01)	0.01 (-0.04-0.01)	-0.10 (-0.23-0.03)	0.00 (-0.02-0.02)	0.00 (-0.02-0.03)	-0.06 (-0.23-0.11)

[1] Posterior Odds Ratios; [2] Posterior Mean Ratios

Figure 1: CONSORT flow diagram



Supplementary File: MCMC diagnostic (illustrative: binge drinking in last 30 days)